Advanced Laptop and Small Personal Computer Technology

A Presentation For

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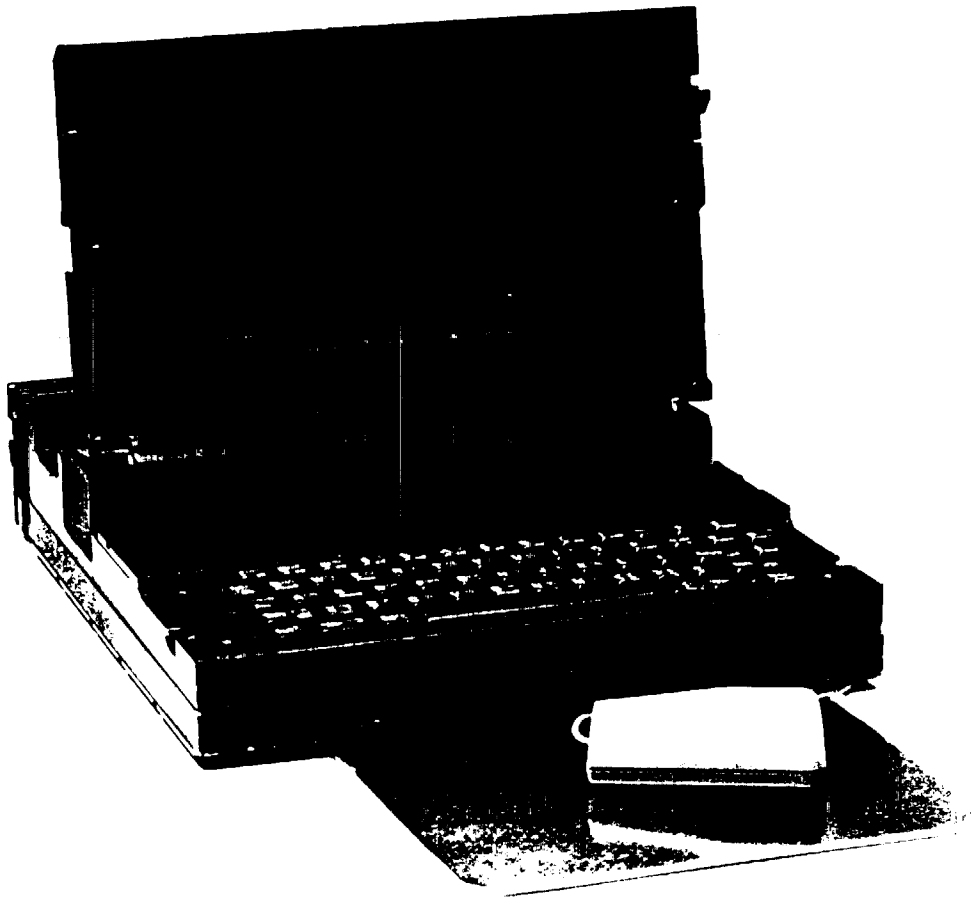
HAND CARRIED COMPUTERS AND MOBILE WORKSTATION TECHNOLOGY

- Background
- Applications
- High End Products
- Technology Trends
- Requirements for the Control Center Application
- Recommendations for the Future

MOBILE WORKSTATIONS

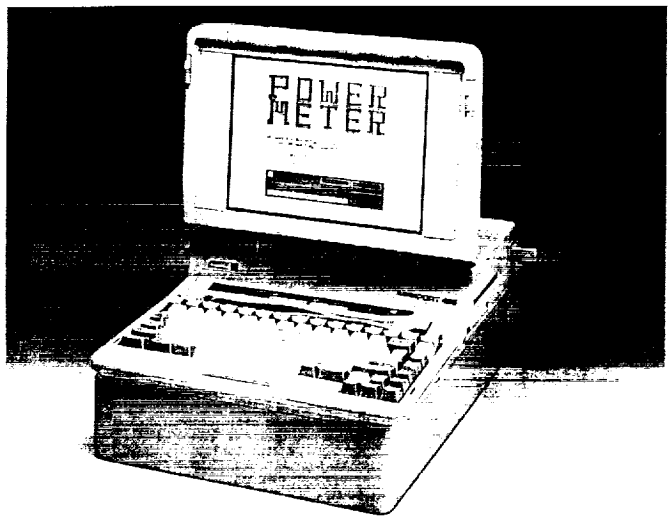
- Small, compact workstations embedded in a mobile platform, e.g., ships, submarines, trucks etc.
- Small, compact workstations that can be hand carried by operating personnel, e.g., notebooks, laptops, and transportables.

Lightweight Ruggedized, NDI, 32-Bit Tactical Workstation (GRiDSE·T/386)



The Lightweight Computer Unit (LCU) family is the newest member of the Army's Tactical Command and Control Systems (ATCCS) Common Hardware Software (CHS) program. At the heart of the LCU offering are the V1 and V2 Lightweight Computers (LCs) and Tactical Communications Interface Module (TCIM).

The **LCU** is an open system, non-proprietary architecture that provides a POSIX compliant operating system, with the capability to run applications under UNIX or MS-DOS®. Both LC versions will run off-the-shelf software written for IBM™ PCs and compatibles. Optional Special Purpose Boards and peripherals are available to maximize V1 and V2 LC interchangeability.

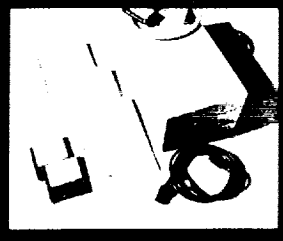


V1 Lightweight Computer (V1 LC)

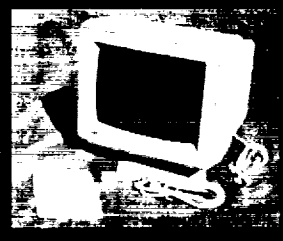
V1 Features

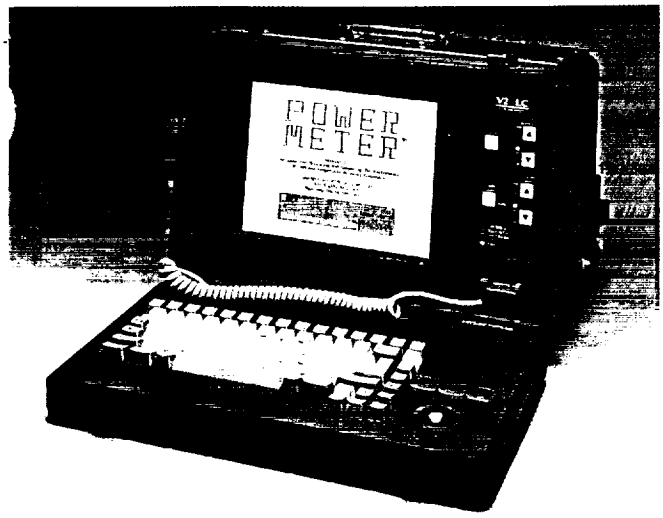
The V1 LC is a commercial 25MHz 486 laptop with 5 standard AT board slots. Manufactured by *Zenith Data Systems*, the V1 LC is equipped with a 120MB internal hard disk, high density 3.5" floppy drive, detachable keyboard, 2.4 Kbps modem, VGA LCD, up to 16MB RAM, and provides over 10 MIPS performance with 100% functional compatibility with its V2 LC counterpart.


Hard Transit Case

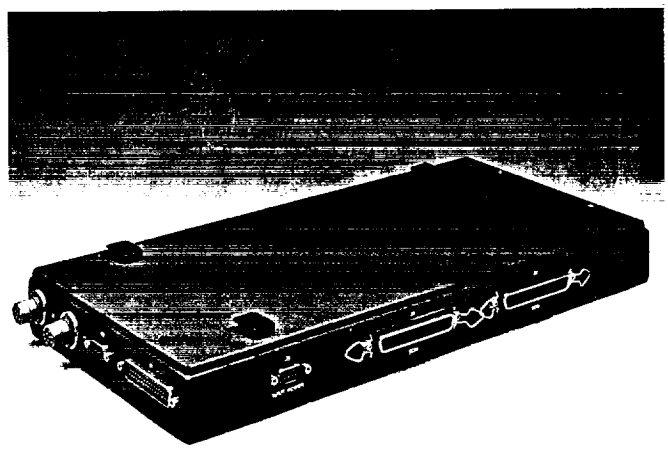

External Hard Drive


External Tape Backup Unit


External Color VGA Display



V2 Lightweight Computer (V2 LC)



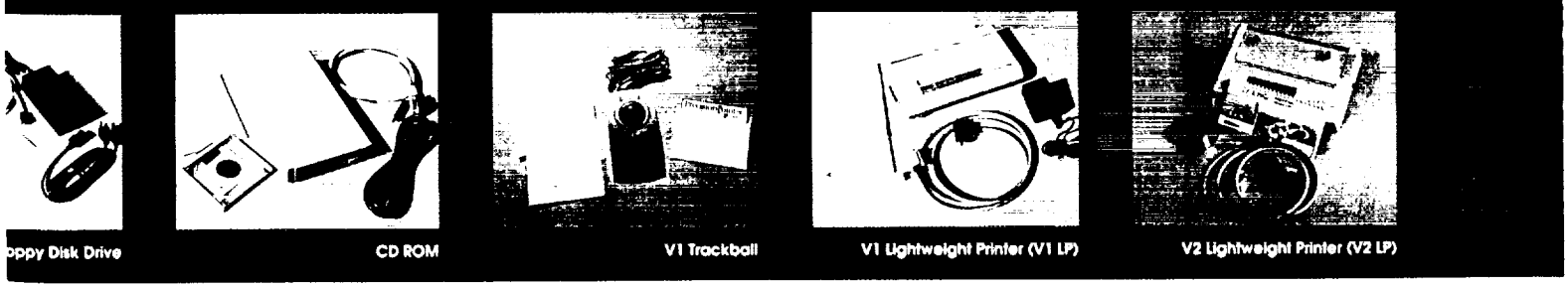
Tactical Communications Interface Module (TCIM)

V2 Features

The **V2 LC** is a ruggedized 25MHz 486 portable with 5 standard AT board slots. Engineered by *SAIC*, the rugged V2 LC is equipped with a removeable 120MB hard disk, high-density 3.5" floppy drive, detachable keyboard, 9.6 Kbps modem, VGA LCD, up to 32MB RAM, and provides over 10 MIPS performance with 100% functional downward compatibility to the V1 LC.

TCIM Features

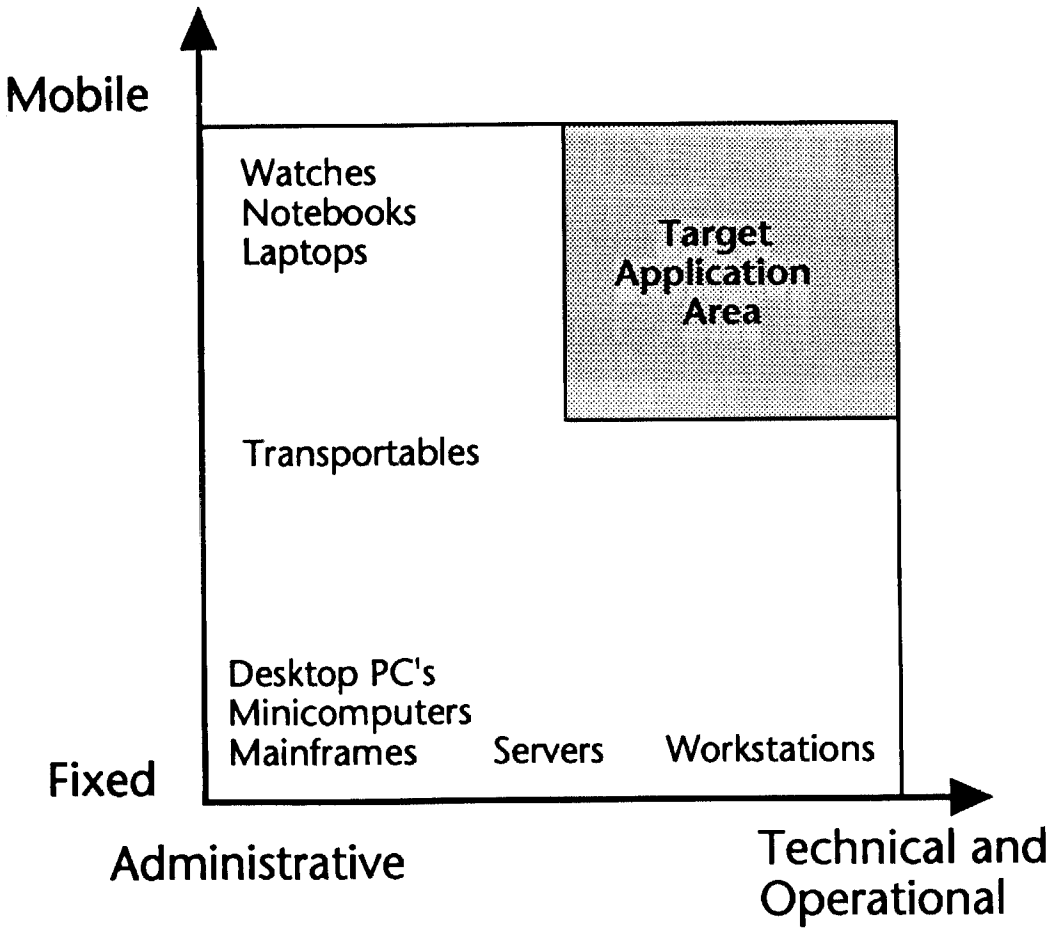
TCIM is based on a 32/16-bit communication-oriented microcontroller coupled with two high-performance Digital Signal Processors (DSP). Designed by *Magnavox*, the TCIM DSPs permit flexibility in performing modulation, demodulation, filtering, gain enhancement of signals, and the ability to off-load computationally-intensive, bit-oriented functions from the microcontroller.



THE FUTURE

- Approximately 45 percent of the U.S. workforce operates outside the office.
- By the Mid–90's a significant fraction of this workforce will require high performance, mobile (portable) workstations.
- Mobile Command Centers will be a key user of this technology.

APPLICATION CHARACTERISTICS



APPLICATION CHARACTERISTICS

- ❑ High value assets are at stake.
- ❑ Time is critical.
- ❑ Users are mobile.
- ❑ Environments are unusual and/or harsh.
- ❑ There are complex problems to solve.
- ❑ Information is needed in a variety of forms from a variety of sources.
- ❑ Users are expert in their field, not in computers.

HIGH END APPLICATIONS

- Operational support of complex systems and experiments
  - NASA Shuttle and Space Station
  - Defense and Government Operations
  - Energy Utilities
  - Communication Utilities
  - Airframe Maintenance
- Maintenance and logistical support of complex systems
  - Transportation Systems
  - Defense Systems
  - Utilities
  - Airlines
- Environmental and Energy Management
  - Management of hazardous materials and activities
  - Emergency management

OTHER APPLICATIONS

- Construction
  - Site assessment and mapping
  - Schedule and resource management
  - Design and construction verification
- Intelligence gathering and dissemination
  - Government
  - Industrial
  - Commercial
- Law Enforcement
  - Airport/Airline Security

KEY COMPONENTS OF A MOBILE WORKSTATION

- ❑ Platform Technologies
- ❑ Communications
- ❑ Application Software

PRIMARY PLATFORM TECHNOLOGIES

- ❑ Processor and Memory
- ❑ Mass Storage
- ❑ Display
- ❑ Person-machine Interface
- ❑ Firmware and Software
- ❑ Packaging
- ❑ Other—System interfaces
- ❑ Peripherals

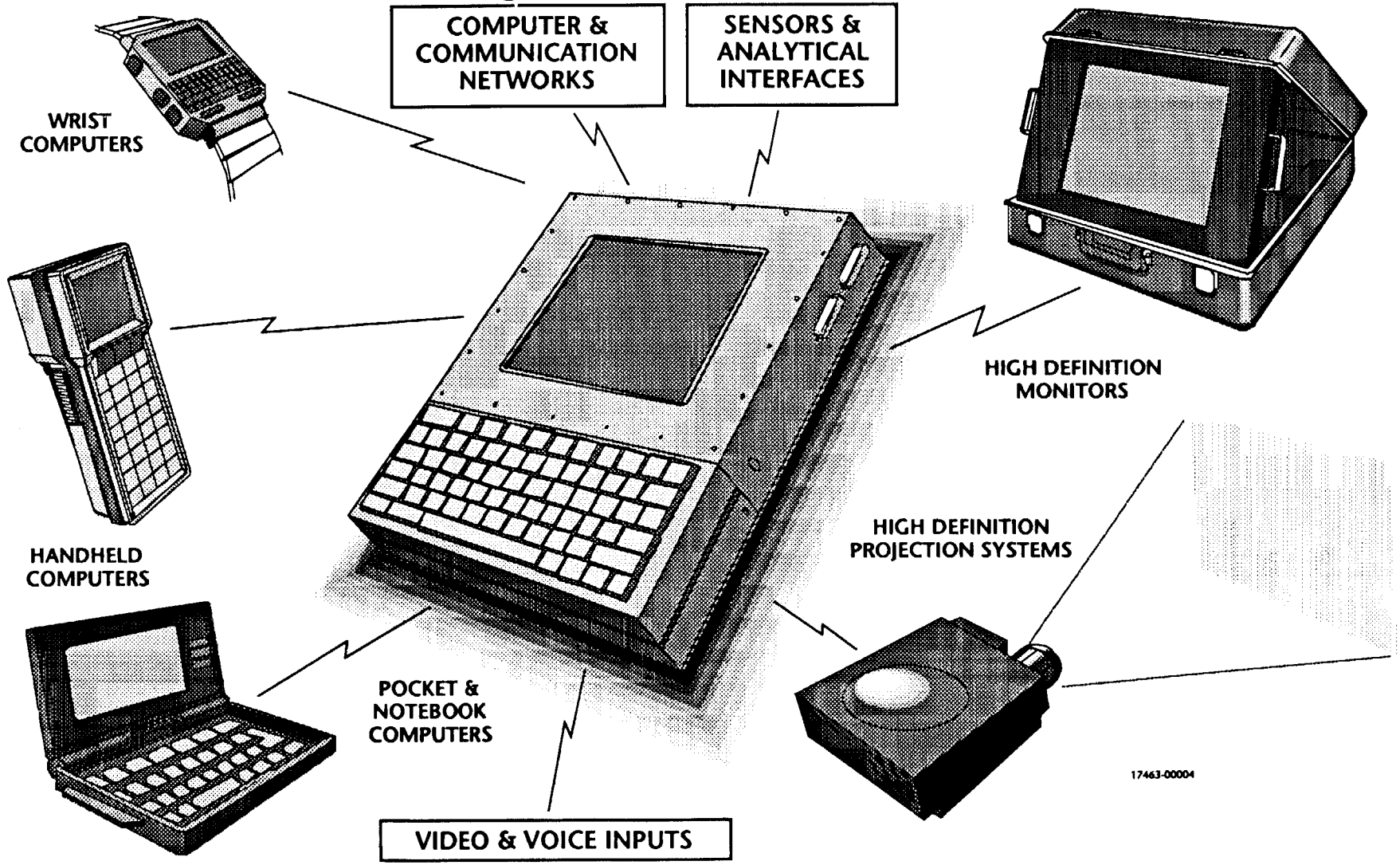
PRIMARY COMMUNICATION AND NETWORK TECHNOLOGIES

- ❑ Modems
- ❑ Data Security
- ❑ Commercial Utilities and Networks
- ❑ Radio and Satellite Links

APPLICATION SOFTWARE

- Current third party workstation software base
- Databases and Query systems
- Authoring tools and Publishing
- Third party software products

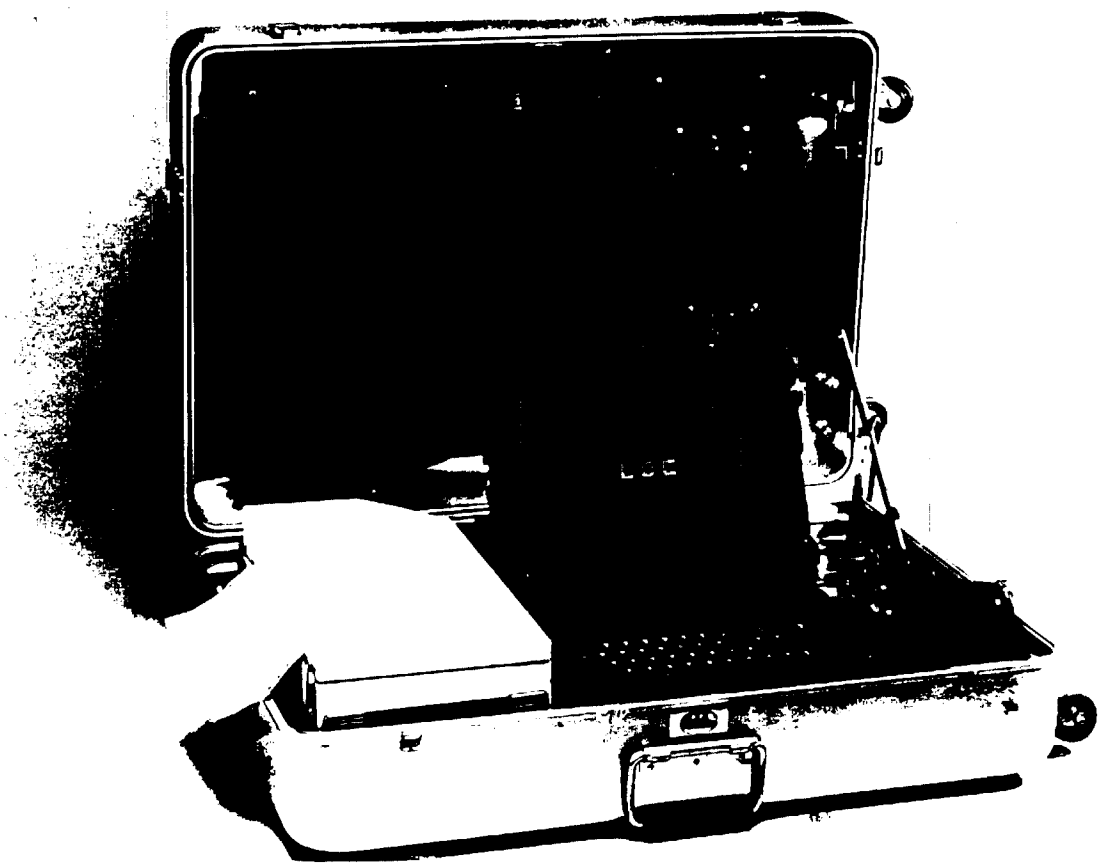
THE AgilePAC™ CONCEPT



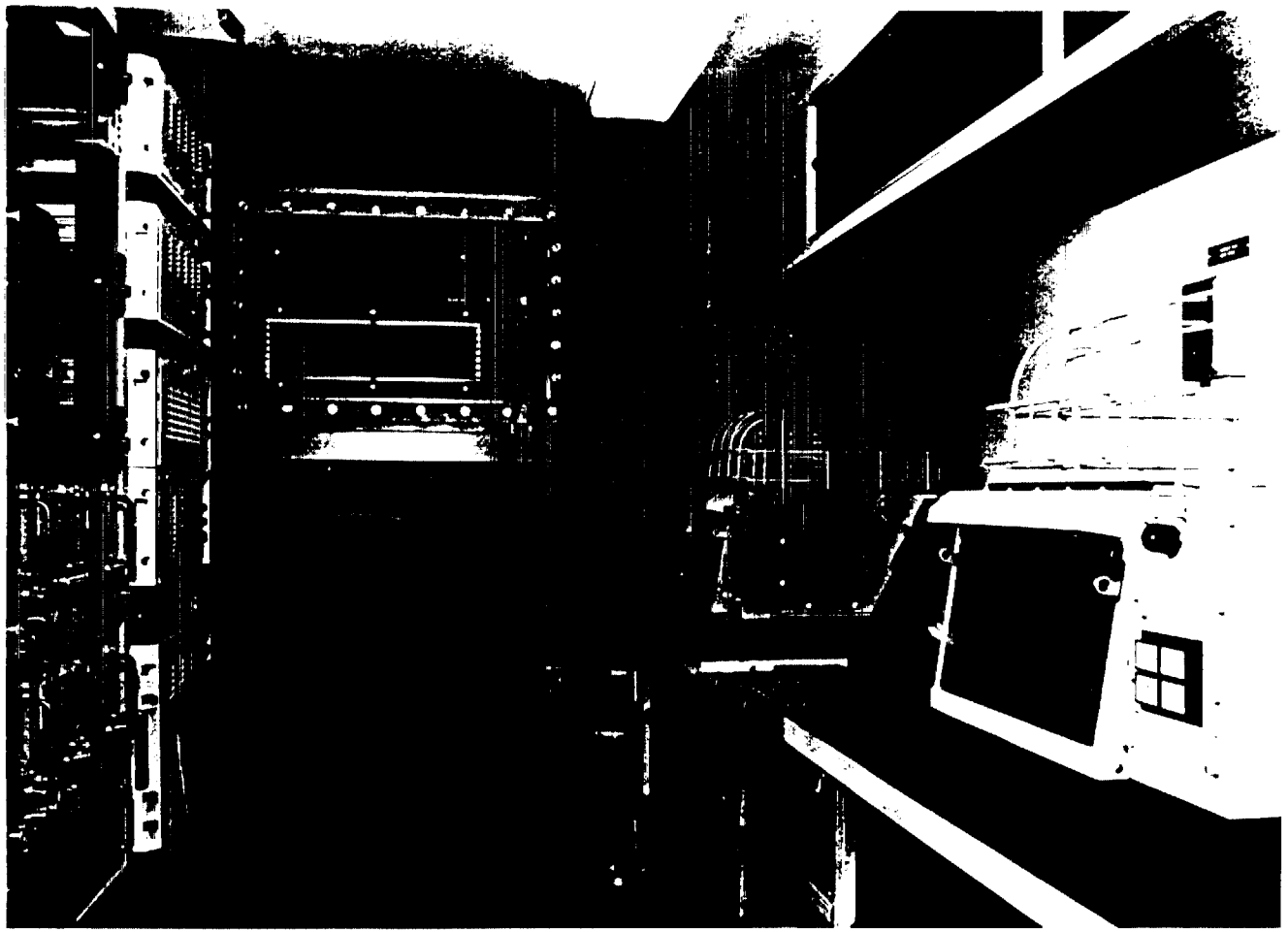
PROVIDING POWER AT THE POINT OF ACTION

- ❑ High Compute Power Density
- ❑ Built-In Networking
- ❑ Modular Design
- ❑ Ruggedness
- ❑ Untethered Network Computing
- ❑ Video and Voice Support (Multi-Media)

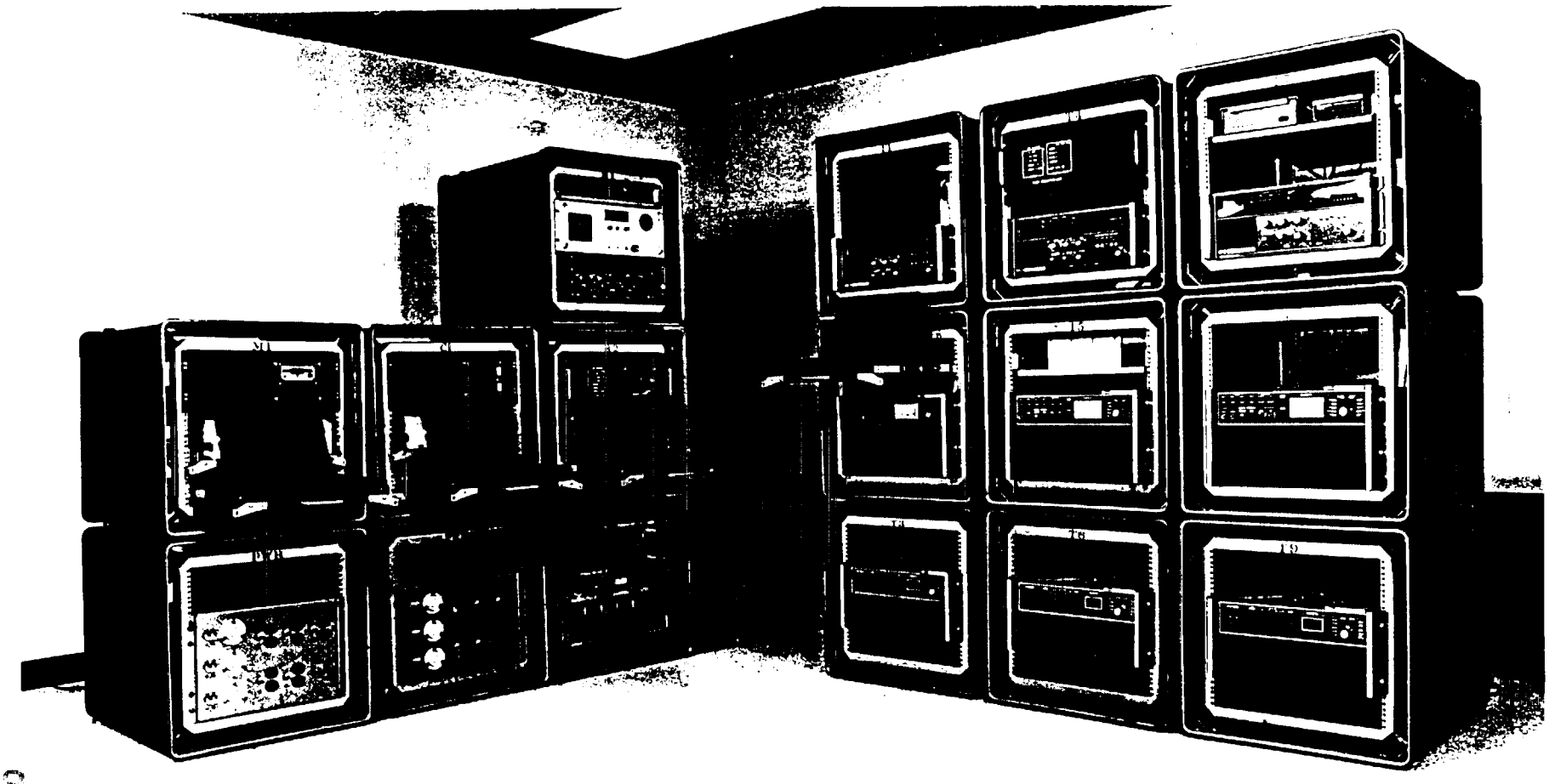
Lightweight Deployable Communication (LDC-1) System (AN/GSC-59)



Lightweight Deployable Communication (LDC-4) System



AN/GSC-62 Table Top Base Station



The AN/GSC-62 Table Top Base Station (TTBS), developed by SAI Technology, is a rugged, lightweight, rapidly deployable, high frequency burst communications system. The TTBS is divided into four component groups; the message, the transmitter, the control and the receiver group. For more information, please contact SAI Technology at 800-447-4373 or 703-527-9400.

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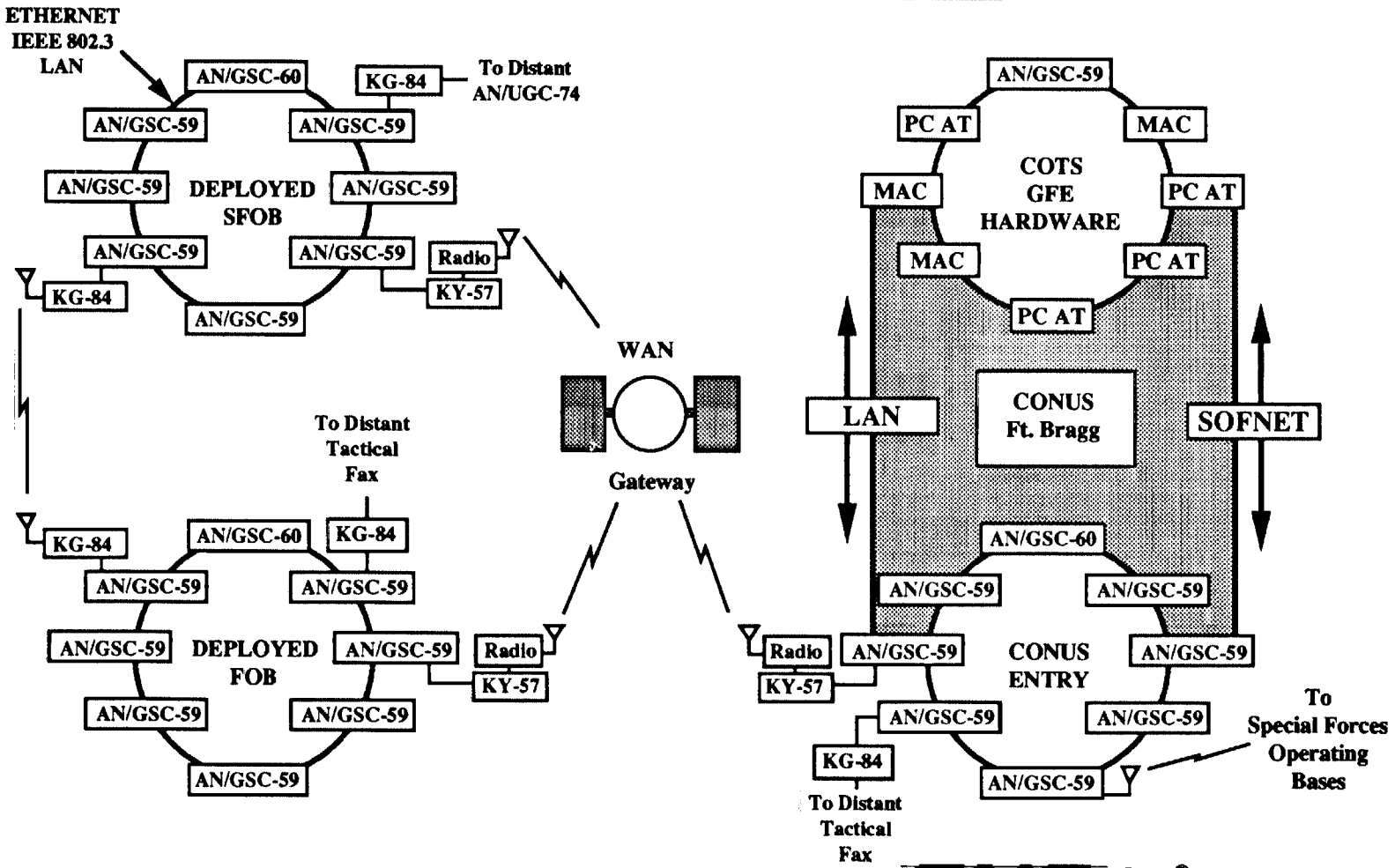
AN/GSC-59 & AN/GSC-60
Global System Architecture



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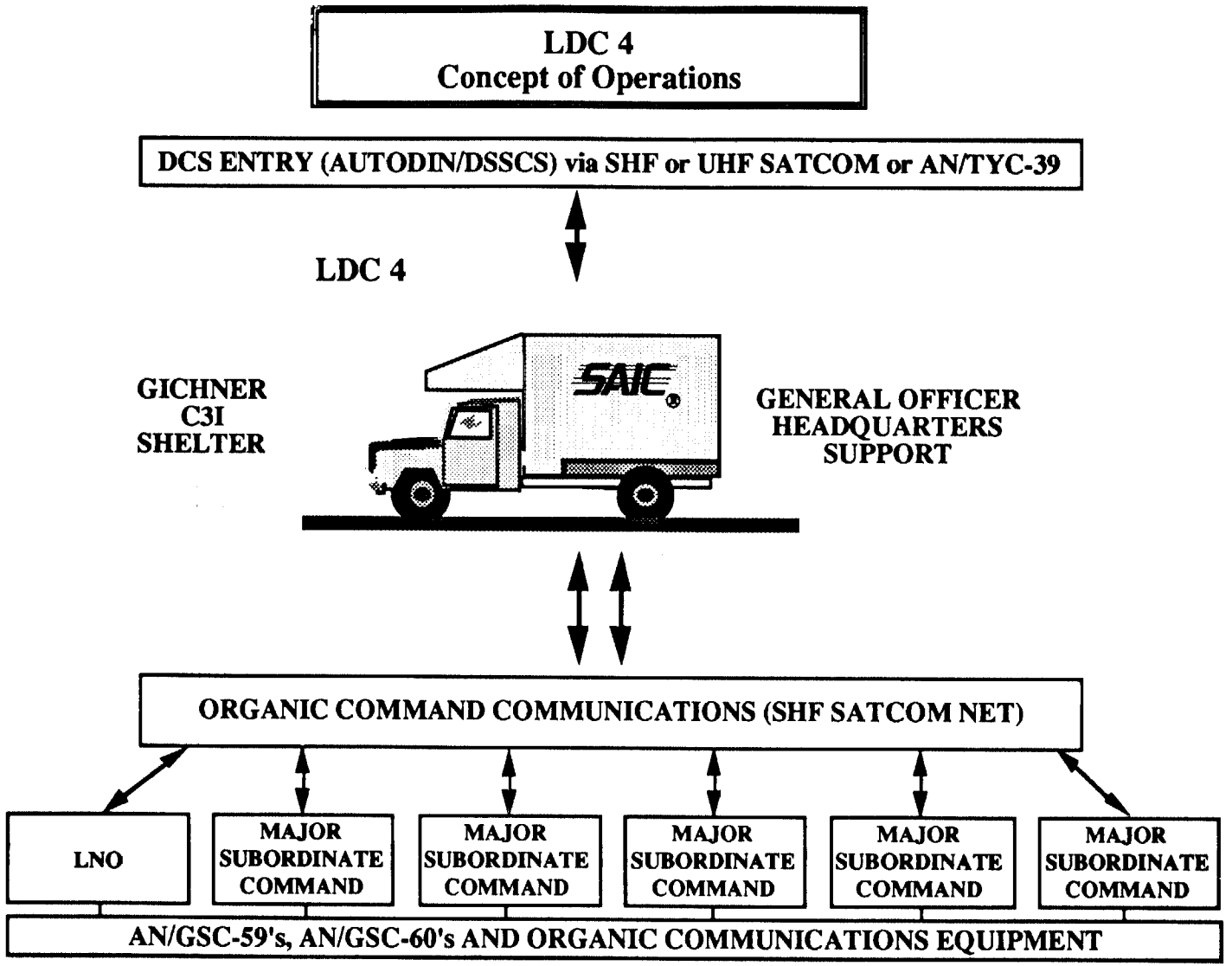
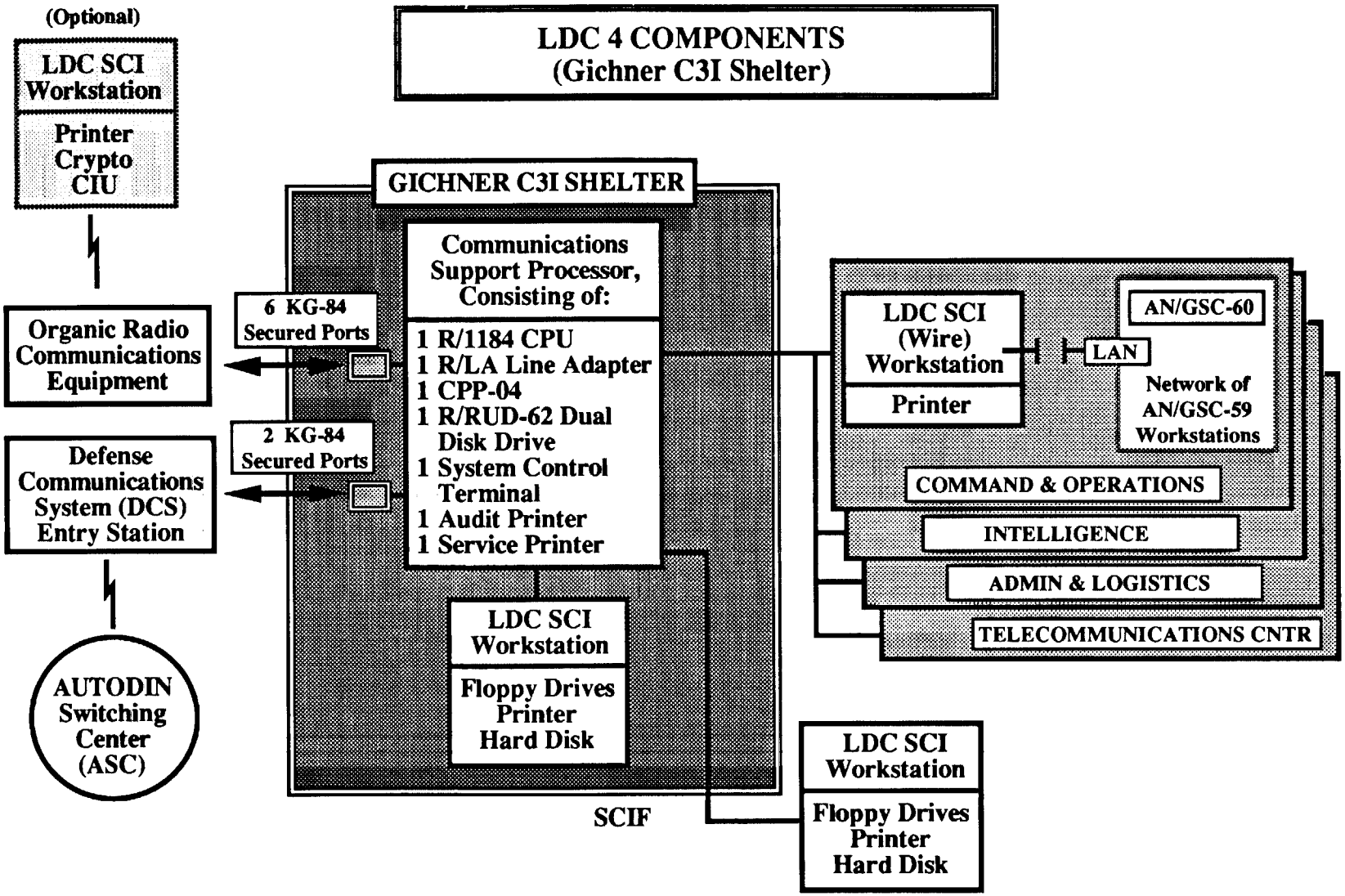
LDC 4 GLOBAL OPERATIONAL REQUIREMENTS

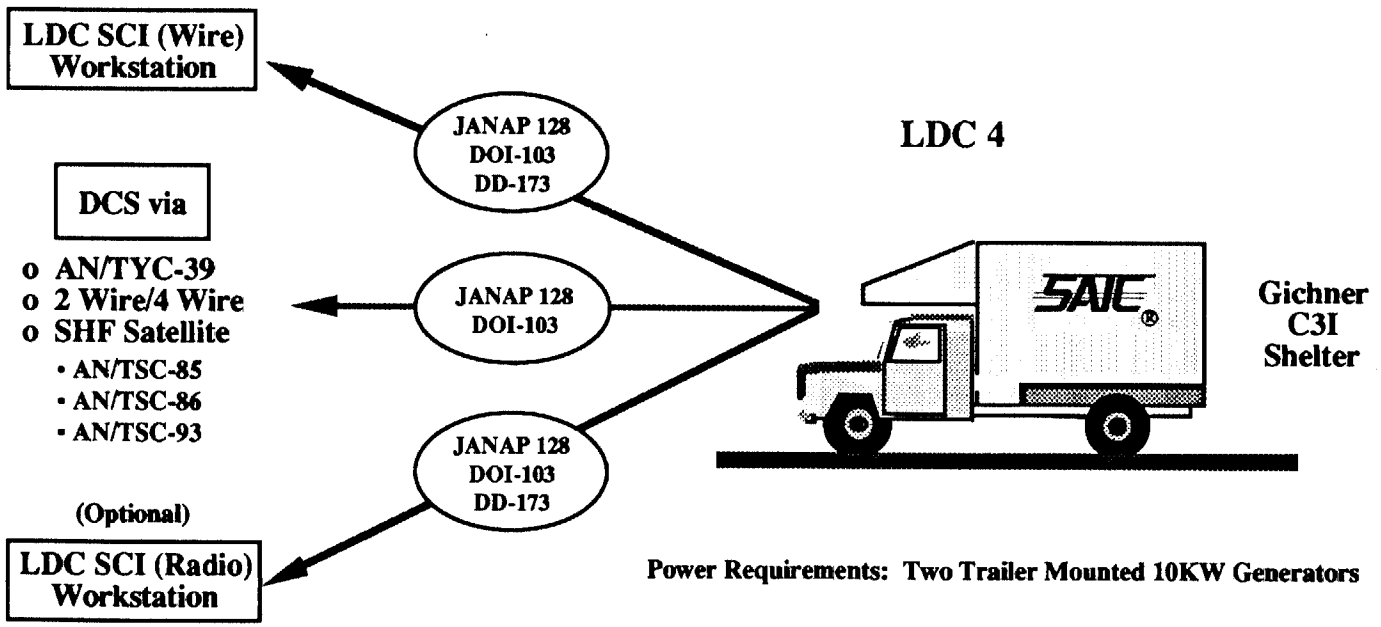
- Lightweight, Ruggedized, Shelter Mounted and rapidly Transportable on a single military aircraft.
- Multiple communications interfaces including 2/4 wire, SHF SATCOM and Crypto devices.
- Automatic Message Processing for AUTODIN including Janap 128 and DOI 103.
- Key functional staff automation support for Command and Operations, Intelligence, Administration and Logistics.



Advanced Workstation Technology



LDC 4
External Interface & Connectivity



Power Requirements: Two Trailer Mounted 10KW Generators

AN/GSC-62
Operational Capabilities

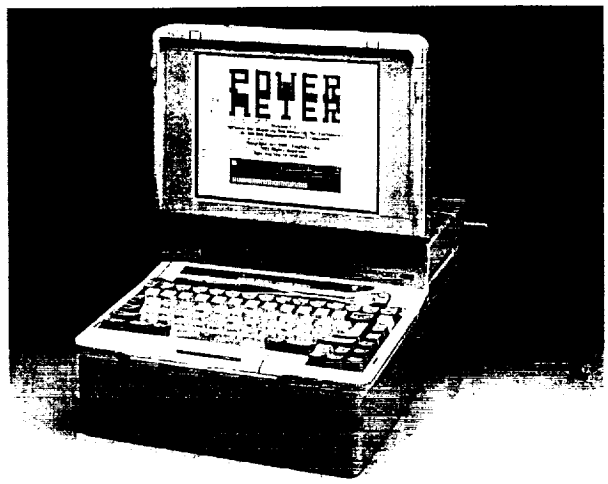
- REPLACES EXISTING AN/TSC-99 BASE STATION
- AROUND THE CLOCK (24 HOUR) OPERATIONAL CAPABILITY
- PROVIDES MESSAGE GENERATION, ENCRYPTION, DECRYPTION, TRANSMISSION & RECEPTION
- TRANSMISSION CAPABILITY UP TO 96 MESSAGES PER DAY
- DEMONSTRATED 'SET UP' CAPABILITY IN < 2 HOURS
- TOTAL SYSTEM WEIGHT < 2500 POUNDS
- TOTAL SYSTEM CUBIC CAPACITY < 140 FT^3
- TRANSIT CASES ARE 2-MAN CARRY CAPABLE
- TRANSMITTER GROUP REQUIREMENT - ONE 10 KW GENERATOR
- MESSAGE, CONTROL & RECEIVE GROUP REQUIRES <400 WATTS 110V AC POWER
- TWO MODES OF OPERATION: SOICS (KL-52) & EXISTING DMDG

RECOMMENDATIONS FOR FUTURE RESEARCH AND DEVELOPMENT

- ❑ High density, low cost packaging for mobile user environments
- ❑ High performance but low battery power hardware and software
- ❑ Mobile radio network technology
- ❑ Security — User and Data
- ❑ Code Book processing
- ❑ Application software
- ❑ Remote (communicating) miniaturized sensors

V1 LC

Lightweight Computer Unit (LCU) Program



The **Version One Lightweight Computer (V1 LC)** is a lightweight, commercial 25MHz 486 laptop with 5 standard AT board slots supporting the operational requirements of the U.S. Army Tactical Command and Control System (ATCCS) Common Hardware Software (CHS) program. Designed by Zenith Data Systems, the V1 LC is equipped with a 120MB internal hard disk drive, high-density 3.5" floppy disk drive, detachable keyboard, 2400 bps modem, VGA LCD screen, up to 16MB RAM, is powered from 110/220 VAC or a two-hour rechargeable battery, and provides over 10 MIPS performance with 100% functional compatibility with its V2 LC counterpart.

The V1 LC is an open systems, non-proprietary architecture that supports a POSIX compliant operating system with the capability to run applications under UNIX or MS-DOS®. The V1 LC will run the vast amounts of commercial off-the-shelf software written for IBM™ PCs/PC compatibles.

The commercial V1 LC supports the external LCU Tactical Communication Interface Module (TCIM). Designed by Magnavox, the TCIM is based on a powerful 32/16-bit communication-oriented microcontroller processor coupled with two high performance Digital Signal Processors (DSP). These DSPs permit flexibility in performing modulation, demodulation, filtering, gain enhancement of signals, and the ability to off-load computationally-intensive, bit-oriented functions from the microcontroller.

Features

- 25MHz 80486 32-bit processor with an embedded Floating Point Processor
- Full 32-bit data path to zero-wait-state memory
- Internal 2400 bps modem with RJ-11 telephone and data path connectivity
- Detachable 82-key subset of IBM enhanced keyboard with 101-key functionality
- Unique operator display and control panel for enhanced visual LC system status
- 640 x 480 VGA Compatible 10" diagonal LCD screen supporting 16 Levels of Shading
- Perpetual time-of-day / date clock with integral battery
- Standard AC power, European AC power adapter, DC rechargeable batteries & cables
- AC-DC converter/battery charger with cable
- 5 standard full-length PC/AT card slots for commercial off-the-shelf AT boards
- Common set of peripherals, connectors, and cables for the V1 & V2 LC platforms
- Soft carrying case to house the V1 LC, trackball, cables and commercial manuals
- Maximum compatibility with the entire suite of CHS LCU hardware peripherals

V1 LC

Specifications

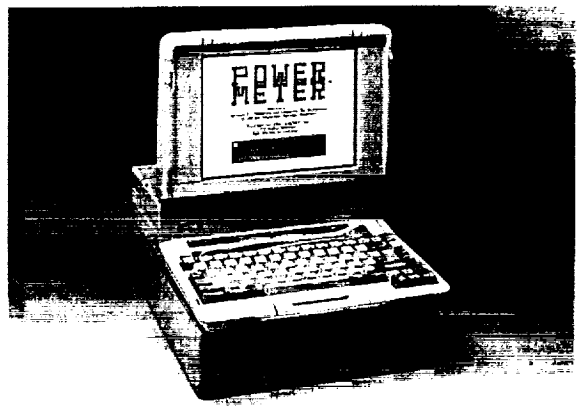
Functional

Display:	640 x 480 VGA compatible, 10" diagonal LCD screen supporting 16 levels of shading
Expansion:	5 full-length PC/AT card slots
Processor:	25MHz 80486 with embedded floating point processor
Memory:	4MB RAM standard with expansion up to 16MB
Keyboard:	Detachable 82-key subset of IBM enhanced keyboard with 101-key functionality
Pointing Device:	3-button Trackball
Mass Storage:	3.5" 1.44MB Floppy Disk Drive; Internal 120MB Hard Disk Drive (19msec)
Interface:	Standard Centronics Parallel Port; Standard 9-Pin Serial Port; Standard VGA Port for External Color Monitor; 2400 bps Hayes compatible modem with telephone and data RJ-11 jacks; External Floppy Drive Port; External TCIM Power
Reliability:	10,000 Hours MTBF
Maintainability:	Predicted MTTR of 0.18 Hours

Environmental

- UL Listed
- Complies with FCC Part 15, Class B
- Best Commercial Operating Environment Standards

TQM
Total Quality Management



Physical

Dimensions:	Height 6.6", Width 12.4", Depth 15.2"
Weight:	22.5 lbs.

Electrical

Input voltage:	110/220 VAC, 50/60 Hz Rechargeable Battery Pack for 2 hours operation

Optional V1 LCU Special Purpose Boards

- MIL-STD-1553
- SCSI
- Speech Synthesis
- Group 3 Facsimile
- IEEE-488
- IEEE 802.3 LAN

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10240 Sorrento Valley Road, Suite 203
San Diego, CA 92121
1-800-772-2LCU or 1-800-447-4373

V2 LC

Lightweight Computer Unit (LCU) Program

The **Version Two Lightweight Computer (V2 LC)** is a ruggedized 25MHz 486 portable with 5 standard AT board slots supporting the operational requirements of the U.S. Army Tactical Command and Control System (ATCCS) Common Hardware Software (CHS) program. Designed by SAIC, the rugged V2 LC is equipped with a removeable 120MB hard disk drive, high-density 3.5" floppy disk drive, detachable keyboard, 9600 bps modem, VGA LCD screen, up to 32MB RAM, is powered from military vehicles, 110/220 VAC or a two-hour rechargeable battery, and provides over 10 MIPS performance with 100% functional downward compatibility to the V1 LC.

The V2 LC is an open systems, non-proprietary architecture that provides a POSIX compliant operating system with the capability to run applications under UNIX or MS-DOS®. The V2 LC will run the vast amounts of commercial off-the-shelf software written for IBM™ PCs/PC compatibles.

The ruggedized V2 LC supports both an internal AT size Tactical Communications Interface Module (TCIM) board (via build-in internal SCSI interface) and external TCIM configurations. Designed by Magnavox, the TCIM is based on a powerful 32/16-bit communication-oriented microcontroller processor coupled with two high performance Digital Signal Processors (DSPs). These DSPs permit flexibility in performing modulation, demodulation, filtering, gain enhancement of signals, and the ability to off-load computationally-intensive, bit oriented functions from the microcontroller.

Features

- 25MHz 80486 32-bit processor with an embedded Floating Point Processor
- Full 32-bit data path to zero-wait-state memory
- Internal 9600 bps modem with RJ-11 telephone and data path connectivity
- Detachable 82-key subset of IBM™ 101-key enhanced keyboard with embedded trackball
- 640 x 480 VGA compatible 10" diagonal LCD screen supporting 16-levels of shading
- Unique operator display and control panel for enhanced visual LC system status
- Perpetual time-of-day / date clock with integral battery
- Standard AC power, European AC power adapter, DC rechargeable batteries & cables
- Military vehicle power and AC-DC converter/battery charger with cables
- 5 standard full length PC/AT card slots for commercial off-the-shelf AT boards
- Common set of peripherals, connectors and cables for the V1 & V2 LC platforms
- Soft carrying case for V2 LC, cables, adapters, and commercial manuals
- Rugged hard transit case for V2 LC with soft carrying case, cables, and accessories
- Maximum compatibility with entire suite of CHS LCU hardware peripherals

V2 LC

Specifications

Functional

Display:	640 x 480 VGA compatible, 10" diagonal LCD screen supporting 16 levels of shading
Expansion:	5 full length PC/AT card slots
Processor:	25MHz 80486 with embedded Floating Point Processor
Memory:	8MB RAM standard with expansion up to 32MB RAM
Keyboard:	Detachable 82-key subset of IBM™ enhanced keyboard with 101-key functionality
Pointing Device:	Keyboard-embedded 3-button Trackball
Mass Storage:	3.5" 1.44MB Floppy Disk Drive; Internal 120MB Hard Disk Drive (19msec)
Interface:	Standard Centronics Parallel Port; Standard 9-Pin Serial Port; Standard VGA Port for External Color Monitor; 9600 bps Hayes compatible modem with telephone and data RJ-11 jacks; External Floppy Drive; Standard SCSI Port (ANSI X3.131-1986); External TCIM Power
Reliability:	10,000 Hours MTBF
Maintainability:	Predicted MTTR of 0.18 Hours

Physical

Dimensions:	Height 9.5", Width 16.0", Depth 10.4"
Weight:	27.5 lbs.

Electrical

Input voltage:	110/220 VAC, 50/60 Hz or 9-32 VDC Rechargeable Battery Pack for 2 hours operation

Environmental (MIL-STD-810E)

Temperature:	Operating range: -13° to +120°F (-25° to +49°C) Non operating range: -25° to +150°F (-32° to +65°C)
Temp Shock:	+70° to -13°F (+21° to -25°C) and +70° to +120°F (+21° to +49°C) in 10-minute intervals
Shock:	30° rotational drop per MIL-STD-810E, Method 516.4, Proc IV&VI
Vibration:	Track Vehicle operation per MIL-STD-810E, Method 514.4, Proc I
Altitude:	10,000 feet.
Rainproof:	1.8 inches per hour in 20 MPH wind for 30 minutes
Humidity:	Operating: -10 to 95% Non operating: -5 to 95%.
Sand/Dust:	20 MPH to ±3MPH for 30 minutes
Climate:	Fungus resistant
EMI:	Complies with FCC Part 15, Class B

Optional V2 LCU Special Purpose Boards

- MIL-STD-1553
- Counter-Timer
- Speech Synthesis
- SCSI (Additional SCSI)
- Digital Multimeter (DMM)
- Group 3 Facsimile
- IEEE-488
- IEEE 802.3 LAN

TQM Total Quality Management

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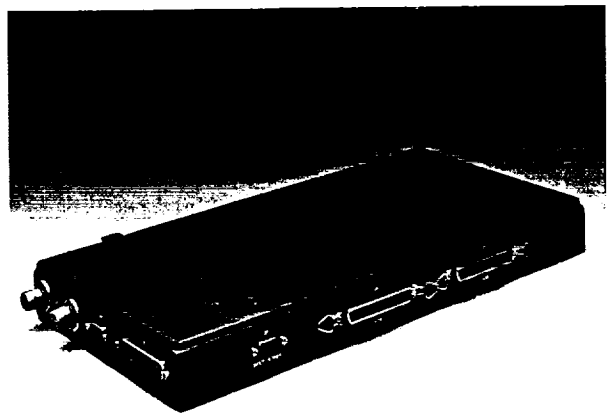
TCIM

Lightweight Computer Unit (LCU) Program



The **Tactical Communication Interface Module (TCIM)** is an advanced modem that contains appropriate processing and memory capabilities to perform as a front-end communication processor for both V1 and V2 LC computers. The LCU TCIM provides a powerful communication interface architecture essential to supporting the operational communication requirements demanded by the U.S. Army Tactical Command and Control System (ATCCS) Common Hardware Software (CHS) program. The TCIM provides two programmable communication channels, each configured independently via software downloads from the LC computers.

Designed by Magnavox, the TCIM is based on a powerful 32/16-bit communication-oriented microcontroller coupled with two high-performance Digital Signal Processors (DSP). These DSPs permit flexibility in performing modulation, demodulation, filtering, gain enhancement of signals, and the ability to off-load computationally-intensive, bit oriented functions from the microcontroller. Use of RAM based software downloaded from the V1/V2 LCs provides not only channel configuration, but also provides an easy path for implementing future communication capabilities.

Features

- Lightweight, compact, low power
- Two Versions
  - External Chassis for V1 and V2 Lightweight Computers
  - Internal Circuit Card for V2 Lightweight Computer
- High Performance 32-Bit Communication Microcontroller with 16-Bit Data Paths
- State-of-the-Art Digital Signal Processor (DSP) Technology
- Programmable Communication Channels configured via download from host computer
- SCSI interface to host computer for maximum flexibility across many host platforms

TCIM

Specifications

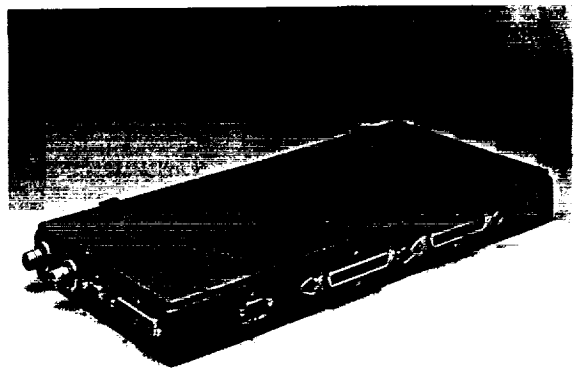
Communications Interfaces (Programmable)

Channel 1:
- KY-68 (DSVT), TA-1035 (DNVT), KG-84 (DLED)
- AN/GYC-7 ULMS
- SB-3614 Switchboard
- EPUU JTTDS
- 4-wire: FSK-188C; FSK-188B; STANAG 4202 (Annex A); Condition Diphase (CDP)
- Protocols: Maneuver Control System (MCS) Circuit Switch protocol; Marine Tactical Systems (MTS) TIDP Mode VII protocol; X.25

Channel 1 or Channel 2:
- Combat Net Radio (CNR): VRC-12 and PRC-77; SINCGARS; GRC-193, GRC-213, PRC 104
- KY-57
- 2-wire: FSK-188C; FSK-188B; STANAG 4202 (Annex A); Condition Diphase (CDP)
- Protocol: Maneuver Control System (MCS) CNR protocol; Marine Tactical Systems, (MTS) TIDP CNR protocol; MIL-STD-188-110A

Functional

Processor:	32/16 Bit Microcontroller (MC 68302); 2-Digital Signal Processors (DSP56001)
Memory:	Microcontroller: 768KB RAM and 256KB EPROM Digital Signal Processors: Minimum of 192KB RAM each
Interface:	Tactical Communications via ports J1, J2, P1, and P2; V1 and V2 LC via SCSI (ANSI X3.131 - 1986) port J3; SCSI bus extension via port J4; Power via port J5
Reliability:	Internal TCIM: 14,000 hours MTBF External TCIM: 11,000 hours MTBF
Maintainability:	Predicted MTTR of 0.25 hours for internal and external TCIM



Environmental (MIL-STD-810E)

Temperature:	Operating range: -13° to +120°F (-25° to +49°C) Non operating range: -25° to +150°F (-32° to +65°C)
Temp Shock:	+70° to -13°F (+21° to -25°C) and +70° to +120°F (+21° to +49°C) in 10-minute intervals
Shock:	30° rotational drop per MIL-STD-810E, Method 516.4, Proc IV&VI
Vibration:	Track Vehicle operation per MIL-STD-810E, Method 514.4, Proc I
Altitude:	10,000 ft.
Rainproof:	1.8 inches per hour in 20 MPH wind for 30 minutes
Humidity:	Operating: -10 to 95%; Non operating: -5 to 95%.
Sand/Dust:	20 MPH to ±3MPH for 30 minutes
Climate:	Fungus resistant
EMI:	Complies with FCC Part 15, Class B

Physical

Dimensions:	External TCIM: Height 1.6", Width 8", Length 10" Internal TCIM: Standard full-length PC/AT card size
Weight:	External TCIM: 3.8 lbs. Internal TCIM: 0.75 lbs.

Electrical

Input voltage:	External TCIM: 18-36 volts DC Internal TCIM: ±5 volts (derived from host computer)
Consumption:	External TCIM: 15 watts max Internal TCIM: 12 watts max

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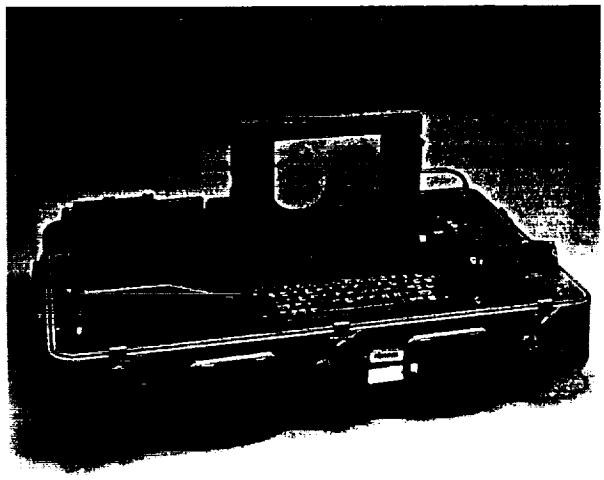
10240 Sorrento Valley Road, Suite 203
San Diego, CA 92121
1-800-772-2LCU or 1-800-447-4373

Lightweight Deployable Communication (LDC-1) System

AN/GSC-59 (V)-1



The Lightweight Deployable Communication System (LDC-1), AN/GSC-59(V)-1, developed by SAIC is a self-contained, Non-Development Item (NDI), stand-alone and networked (LAN/WAN) communications and staff C^3I automation workstation. The AN/GSC-59(V)-1 provides portable, rugged communication and workstation capabilities for a variety of military requirements. Originally designed for the U.S. Special Operation Command and Light Forces, the system's open architecture and modular design permit the AN/GSC-59(V)-1 to be custom configured to match varied mission requirements.

The AN/GSC-59(V)-1's rugged construction makes it ideal for both sustaining base and tactical operations. At the heart of the system is SAIC's GRiDSE-T™ 386 ruggedized portable computer as the host CPU. Housed in an aluminum carry case for rapid deployment, the system offers multiple secure communication interfaces for HF, VHF and UHF satellite transmission. The AN/GSC-59(V)-1 provides enhanced C3I, electronic warfare, intelligence communications, administration and logistics capabilities at all echelons of command.

Features

Hardware

- NDI & Ruggedized
- Lightweight & Portable
- Self-Contained Transit Case
- Power Sources 28V/110V/220V
- 32-Bit Processor
- Embedded 40MB Hard Disk
- Internal Diagnostics
- Configurable Serial Ports
- IBM PC Compatible

Support Software

- MS-DOS
- UNIX V
- Windows 3.0
- TCP/IP
- Multiuser
- Multitasking

Application Software

- Terminal Emulation
- Teletype Emulation
- Group 3 Fax Emulation
- Tactical Fax Emulation
- Networking (LAN/WAN)
- E-Mail
- NITF
- DCS Mode 1 (CAT I & III)
- JAMPS Compatible
- Message Processing
- Gateway Software
- Packet Radio
- AUTODIN
- Network Conferencing

Peripherals & I/Os

- Ethernet (IEEE 802.3)
- SCSI Compatible
- Embedded AX.25
- HF, VHF, UHF Compatible
- KG-84A/C, KY-57 Interfaces
- STU III Compatible
- DDN Interface
- Ruggedized Floppy Drive(s)
- Ruggedized Printer
- Video Frame Capture

LDC-1

Specifications

System Architecture

AN/GSC-59(V)-1 is an independent, self-contained workstation with a GRiDSE-T™ 386 computer; 3.5" floppy disk drive; printer; AC/DC power supply; COMSEC device interface; radio handset interface; trackball/mouse; and networking provisions.

Functional

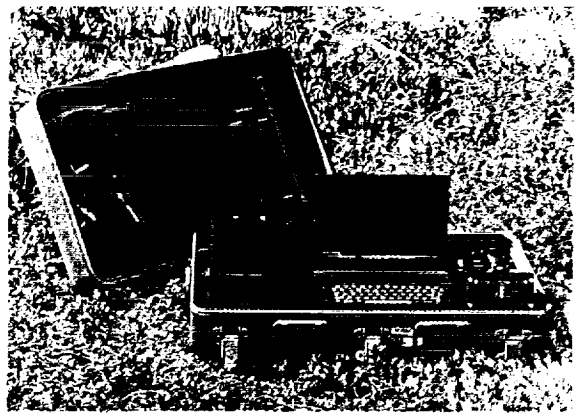
Processor:	80386, 32-bit
Co-Processor:	80387
Clock:	Battery powered
Memory:	4 MB RAM, up to 512KB EPROM, 40MB Hard Drive
Interface:	Centronics; GPIB; RS-232C PC Compatibles; Ethernet; SCSI Port; NTSC; Standard Radio Handset; Trackball/Mouse
Test:	Built-in (on power-up)
Display:	Electroluminescent (EL) flat panel 640x350 pixels with full alphanumeric and graphics capabilities
Keyboard:	Mechanical, 59 keys

Physical

Dimensions:	32.2"x20.2"x11.5"
Weight:	115 lbs
Chassis and case:	Heavy duty aluminum

Electrical

Power:	110 VAC, 47-63 Hz; 400 Hz
Requirements:	220 VAC, 47-63 Hz
Consumption:	100 W typical, 20-30 VDC



Communications

AUTODIN (DCS Mode 1)
Group 3 FAX Emulation
UXC-7A Tactical FAX Emulation
UGC-74 TTY Emulation
UGC-129 TTY Emulation
KY-57 Interface
KG-84A/C Interface
STU III Interface
RJ-11 (Telephone)

Software Applications

MS-DOS
UNIX V
Communications
Word Processing
Spreadsheets
Graphics
Video Image Display
User-Specified Software Applications
Project Management
Database
User-Specified Operational Applications

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SAIT-LCD86

8 x 6 Inch Militarized Liquid Crystal Display

Development Model for the RAH-66 Comanche (LH) Helicopter

SAI Technology is currently developing an 8 x 6 inch color multifunction display (MFD) for the U. S. Army RAH-66 Comanche (LH) Helicopter. SAIT offers Mil-spec versions of the most advanced Active Matrix Liquid Crystal Display (LCD). The SAIT-LCD86 provides major advances over CRT equipment: ***sunlight readability, thinner profile, lighter weight and high reliability.***

The SAIT-LCD86 provides superior performance in all harsh environments: aircraft, ship, submarine and ground mobile platforms. A certified MIL-Q-9858 and MIL-STD-2000 manufacturer, SAI Technology has the capability of producing a family of militarized LCDs, including 2.9 x 3.4, 4 x 4 and 6 x 6 inch configuration.

SAI Technology also offers LCD-controller-software integration capabilities and complete, logistics, training, and maintenance support.

Features

- MIL-E-5400T, MIL-STD-810, and EMC/EMI Qualified
- 8 x 6 Inch Screen (10 Inch Diagonal)
- RGB
- Up to 256 Shades/Color
- ANVIS Capable
- Night and Sunlight Readable
- Frame Rates Up to 90 Hz
- High Contrast Ratios
- Wide Viewing Angles
- High Resolution
- Multiple Interface Capability

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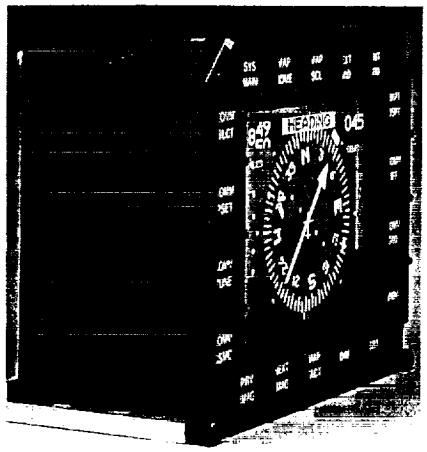

Advanced Avionics Instruments

Employee-owned since its inception, Science Applications International Corporation has annual revenues over $1 billion and 200 offices worldwide. SAIC focuses on the areas of national security, energy, environment, health and high technology products.

SAIC's success confirms our belief that if you want the job done right, talk to the owner. Our employee-owners understand that quality is not an option, but an integral part of our Total Quality Management philosophy. At SAIC, if you're talking to one of our 12,000 employees, chances are you're talking to an owner.

Specifications subject to change without notice

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in Europe contact EQUATECH GmbH
Tel (352) 47 18 17 Fax (352) 47 53 54

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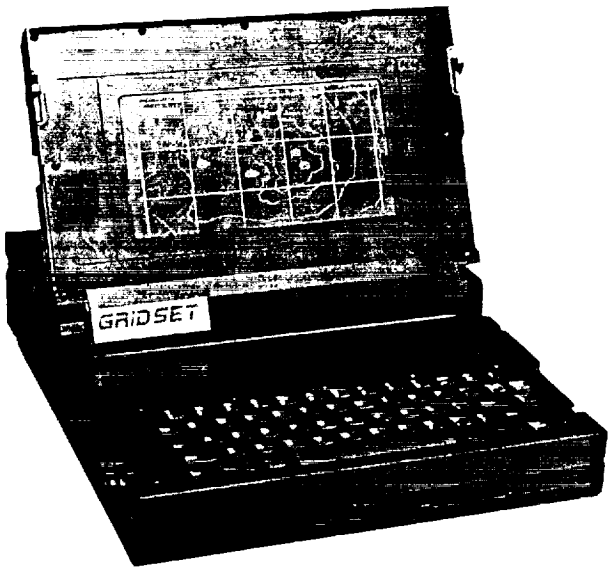


GRiDSE-T™/386

Militarized Portable Workstation

The GRiDSE-T/386 is a 32 bit 80386-based computer designed for severe environments. It offers the power and memory of a mainframe computer in a compact package yet is lightweight, portable and rugged enough for tactical military applications. The GRiDSE-T/386 has one Centronics port, two RS-232C ports, a SCSI port and a floppy disk port, making it compatible with most hardware peripherals. In addition, the GRiDSE-T/386 can run a variety of off-the-shelf software programs and is compatible with the GRiDSE-T family of products for severe environments.

At the heart of the GRiDSE-T/386 is a 20 MHz 32 bit microprocessor and 80387 co-processor along with 4 MB of system RAM. SAI Technology offers a complete line of options and accessories for the GRiDSE-T line of militarized portable computers. These options include up to 512 KB of EPROM, up to 4 MB of non-volatile SRAM, 28VDC battery power supply, sunlight readable LCD display and a DC to DC power converter.

Features

- UNIX® V
- IBM®-AT compatible
- MS-DOS® compatible
- Large electroluminescent display
- Compatible with Mil peripherals
- Floppy interface
- SCSI interface
- Two asynchronous serial ports
- Centronics parallel interface
- EMI/EMC compatibility

SAI® Technology

A division of Science Applications International Corporation

Specifications

GRiDSE-T™/386

Functional

Processor:	80386, 32 bit
Co-Processor:	80387, 80 bit
Memory:	4MB RAM up to 512KB EPROM
Interfaces:	Centronics Two RS-232C PC-compatible SCSI port Floppy disk port
Test:	Built-in (on power up)
Reliability:	Exceeds 10,000 hrs MTBF per Mil-HDBK-217E
Service Life:	10 years
Clock:	Battery powered

Environmental

Temperature:	Operating -30°C to +55°C Storage -57°C to +71°C
Altitude:	Operating 30,000 ft Storage 50,000 ft
Rainproof:	Mil-STD-810D, Method 506.2 Procedure 1
Humidity:	95% condensing
Vibration:	5 g's at 5 to 2000 Hz operating
Shock:	40 g's at 6-9 ms operating
Climate Proof:	Fungus and Salt Atmosphere
Explosion Proof:	Mil-STD-810D, Method 511.2, Procedure 1
Sand/Dust:	Mil-STD-810D, Method 510.2, Procedures 1 & 2, operating
EMI/EMC:	Mil-STD-461B, Part II, Class A1
Tempest:	Designed to meet NACSIM 5100A
Safety:	Mil-STD-454H Requirement 1
Human Factors:	Mil-STD-454H Requirement 62
Workmanship:	Mil-STD-454H Requirement 9

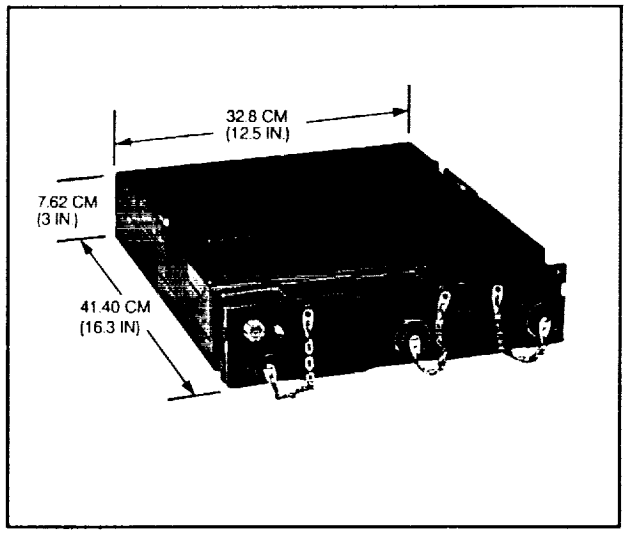
Physical

Dimensions:	16.3" x 12.5" x 3" (41.4 cm x 32.8 cm x 7.6 cm) 9.5" (24 cm) high, display open
Display size:	7.5" x 3.7" (19 cm x 9.4 cm)
Weight:	21.5 lb (9.8 kg)
Chassis and case:	Aluminum
Display:	Electroluminescent flat panel 640x350 pixels with full alphanumeric and graphics capability
Resolution:	85 pixels per inch
Brightness:	20 FL (min) per pixel w/o filter
Keyboard:	Mechanical, 59 keys

Electrical

Power:	110 VAC, 47-63 Hz: 400 Hz
Requirements:	220 VAC, 47-63 Hz
Consumption:	40 W typical

6/89/1500



Software

Operating Systems: UNIX® V
MS-DOS® 3.3
MS-DOS® 4.01

Programming Languages:
Ada Target computer, PL/M, C, Pascal, Assembler, Basic, Fortran

Options

Sunlight readable LCD display
1-4 MB non-volatile built-in SRAM
512 KB Cartridge SRAM
Portable Battery pack
DC to DC power converter
EEPROM capability
Third-party militarized peripherals
Consulting and technical & engineering support

Request GRiDST options packets for addition details.
Specifications subject to change without notice.

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